Appendix E

Guelph, Ontario's Wet/Dry Collection System: Results and Projected Costs

Table E.1
Results of Pilot Collection Program and Proposed Collection and Processing for Full-Scale System

Pilot study years	1989/90/91/92 (ongoing)	
Total households	825	
	Two-Stream Separation	**Three-Stream Separation**
Set-out	(1) Wet fraction--organic waste such as food waste and yard waste; soiled paper, foil, plastic, and other materials; diapers	(1) Wet fraction--organic waste including food waste and yard waste
	(2) Dry fraction--recyclables and nonrecyclables	*(2)* Dry recyclables—including paper, plastic, glass, and metal
		(3) Residual refuse
Collection (proposed)	Dual-compartmentalized packer trucks used to co-collect wet and dry fractions	Two vehicles utilized--one dual com-compartment, one single compartment (proposed)
Processing (proposed for full-scale program --in pilot, dry wastes were not processed)	Wet fraction is taken to a composting facility, where inorganic wet waste is screened out and the remainder is composted; dry waste is sent to a sorting facility where recyclables are separated from non-recyclables. Residuals from both the wet and dry streams are landfilled.	Wet waste is taken to a composting facility; the dry recyclables are taken to a recycling facility, and the refuse is landfilled.
Participation	High (99 percent)	High (99 percent)
Satisfaction	High (82-88 percent of residents slightly or very satisfied)	High (82-88 percent of residents slightly or very satisfied)
Convenience	64 percent found system convenient	62 percent found system convenient.
Containers	Preference for bins over bags. Bins recovered slightly cleaner wet waste.	Preference for bins over bags. Bins recovered cleaner wet waste.
Recovery	95.5 percent of organic materials recovered (84 percent of wet waste organic)	83.1 of organic materials recovered (97 percent of wet waste organic)

	Two-Stream Separation (cont.)	**Three-Stream Separation** (cont.)
Recovery	89.9 percent of potentially recyclable material recovered clean in dry container (52 percent of dry waste recyclable)	78.1 percent of potentially recyclable material recovered clean (66 percent of dry waste recyclable)
Marketability	95.2 percent of recyclables recovered were uncontaminated and marketable.	98.5 percent of recyclables recovered were uncontaminated and marketable.
	Compost meets rigorous proposed Ontario and Canadian standards.	Compost meets rigorous proposed Ontario and Canadian standards.
Diversion Rate **(with current markets)**	68 percent (with carts)	62 percent (with carts)
Advantages/ Disadvantages	• Recovered a larger percentage (14 percentage more) of organic materials	• Recovered a smaller percentage of organic materials
	• Recovered a larger percent (15 percent more) of recyclables	• Recovered a smaller percent of clean recyclables
	• Recyclables slightly more contaminated and less marketable (but total recovery still higher in two-stream)	• Recyclables slightly (3 percent) less contamination and more marketable (that is, no longer is placed in 'garbage" stream)
	• Greater flexibility. If markets make it unprofitable to recover a certain material, sorting plant employees can easily be trained not to pull out this material	• Less flexibility in responding to market changes; have to reeducate population on sorting procedures when an item becomes marketable
	• Collection time and costs lower as one vehicle is used to co-collect wet and dry fractions	• Two collection vehicles utilized
	• Considered easier to implement in multi-unit dwellings and commercial settings	• Considered more difficult to implement in multi-unit dwellings and commercial settings
	• Requires greater emphasis on source reduction to reduce the amount of nonrecyclable, noncompostable, and hazardous material in waste stream	• Less emphasis on source reduction, since nonrecyclable and noncompostable materials are landfilled as a third stream
	• Requires separate collection of household hazardous materials, since all material is handled by workers. Household hazardous can be more easily diverted from landfill.	• Separate collection of household hazardous materials recommended, but not imperative. Household hazardous placed in garbage means it will ultimately be landfilled.

Source: Janet L. Laird, Waste Management Coordinator City Engineer's Department, Guelph, Ontario, personal communication, February and July 1992.

Table E.2
Projected Costs for Guelph, Ontario's Two-stream Wet/Dry Collection Program[a]

Number Serviced	130,000 people countywide (program will first be implemented in Guelph, a city of 92,500 people and 24,000 single-family households)
Waste Generation (projected for 2003)	93,700 tons (84,999 metric tonnes) dry waste 63,900 tons (58,000 metric tonnes) wet waste 156,500 tons (142,000 metric tonnes) total processable waste
Anticipated Diversion (Marketed Material)	50 percent (at least)
Collection	
Capital and Operating	Divided automatic side-loading packer trucks will probably be utilized to collect both wet and dry fractions. Trucks are priced at $100,000 each. The City does not currently know how many vehicles it will purchase, and may retrofit existing trucks for some routes. Operating costs are anticipated to be the same as for refuse collection. Each truck will be operated by one crew member and will service an estimated 400 households per day. (Current refuse runs service 600 to 700 households per truck per day.)
Processing Dry Stream	
Capital Costs	$3.2 million ($3.6 million Canadian) building $5.5 million ($6.2 million Canadian) equipment
Subtotal	$8.7 million ($9.8 million Canadian)
Annual Throughput	93,700 tons
Daily Throughput (assuming 260 days of operation)	360 tons
Capital Processing Costs	$24,200 per TPD processed
Processing Wet Stream	
Capital Coats	
Receiving	$0.5 million ($0.6 million Canadian) building $1 million ($1.2 million Canadian) equipment
Processing	$2.2 million ($2.5 million Canadian) building $1.4 million ($1.6 million Canadian) equipment $.05 million ($.25 million Canadian) bio filter
Subtotal	$5.4 million ($6.2 Canadian)
Annual Throughput	63,900 tons
Daily Throughput (assuming 260 days of operation)	250 tons
Capital Processing Costs	$21,600 per TPD Processed
Household Containers	$97 each ($110 each Canadian)

Grand Total Wet and Dry Capital Costs	$8.7 million dry $5.4 million wet $2.4 million containers $16.5 million $34 million ($39 million Canadian) including land, administration building, construction costs, mobile equipment, testing equipment, and household hazardous waste drop-off site
Annual Throughput	156,500 tons (142,000 metric tonnes)
Daily Throughput (assuming 260 days per year of operation)	600 tons
Grand Total Capital Costs	$57,000 per TPD
Total Processing Operating Costs for Wet and Dry (excluding landfilling but including anticipated revenue for recyclables and a zero dollar revenue for compost)	$5.9 million ($6.7 million Canadian) per year-including collection costs of $2.9 million $38 per ton

Notes: $1 Canadian = $0.88 U.S., 1 metric tonne= 1.1025 short ton

(a) Guelph has not yet finalized its decision to implement a two-stream rather than a three-stream collection program.

Source: Janet L. Laird, Waste Management Coordinator City Engineer's Department, Guelph, Ontario, personal communication, February and July 1992.

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